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EXAMINER

RAPP, CHAD

ART UNIT PAPER NUMBER

2125

DATE MAILED: 01/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/744,171

Applicant(s)

DUIGNAN, MICHAEL T.

Examiner

Chad Rapp

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2125

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10-16, 19, 24, 26 and 27 is/are rejected.
- 7) ☒ Claim(s) 7-9, 17, 18, 20-23, 25 and 28-30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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1. Claims 1-30 are presented for examination.

Allowable Subject Matter

2. Claims 7-9, 17-18, 20-23, 25 and 28-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Objections

3. Claim 17 is objected to because of the following informalities:

In claim 17 line 6 "ins aid" should be "in a".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 12, 13, 16 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nowak in view of Ellis.

Nowak teaches the claimed invention (claim 1) substantially as claimed including a material delivery system for miniature structures fabrication comprising:

- a. A substrate is taught as a receiver(abstract);
- b. Control means operatively coupled to said energy beam and said material carrier element for changing relative position between said material carrier element and said energy beam, thereby exposing respective areas of said deposition layer to said energy beam in a

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patterned fashion is taught as the operation of the system is orchestrated by a controller which operates by means of digital signals the for driver that actuates the laser; the movement assembly that scans the laser over LAT material indexing assemblies and cooling system and sources. The actions of the controller are largely determined by a source of three-dimensional data representing the object to be generated. Data source is typically a computer equipped with CAD software that represents the object as a three-dimensional volume of contiguous elements. The volume is treated as a series of two-dimensional layers contiguous along a third dimension(col. 4 lines 47-60);

c. At least one depositable material being ablated from said respective areas of said deposition layer upon exposure to said energy beam, transferring to said substrate for depositing thereon at regions thereof corresponding to said respective areas of said deposition layer on said material carrier element is taught as the carrier includes a transfer material that is irradiated and solidifies onto a substrate. The irritation of the carrier is in an area pattern corresponding to a deposition layer(abstract).

Nowak teaches the above listed details of the independent claim 1, however, Nowak does not teach: a material carrier element having a deposition layer disposed thereon and displaceable with respect to said substrate, said deposition layer containing at least one depositable material and an energy beam directed towards said material carrier element.

Ellis teaches:

a. A material carrier element having a deposition layer disposed thereon and displaceable with respect to said substrate, said deposition layer containing at least one depositable material is taught as a support substrate(1) with a layer(2) essentially coextensive

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and a laser radiation-ablative carrier top coat also essentially coextensive(col. 4 lines 15-20 and fig. 1 parts 1, 2 and 3);

b. An energy beam directed towards said material carrier element is taught as the laser(col. 4 lines 15-20 and fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made or used to modify the teachings of Nowak with the teachings of Ellis because Ellis adds a protection over coating to a wide variety of substrates.

As to claim 2, Nowak teaches a backing element supporting said deposition layer thereon is taught as the carrier layer(col. 6 lines 1-5 and fig. 3 part 300).

As to claim 3, Nowak teaches wherein said backing element is chosen from the group comprising a tape, a ribbon, a disc, and a pad is taught as the LAT material is in a roll or tape form(col. 3 lines 44-45).

As to claim 12, Nowak teaches wherein said energy beam includes a laser beam is taught as a laser (col.4 line 50).

As to claim 13, Ellis teaches wherein said laser beam includes an ultraviolet laser beam is taught as a laser-irradiated(col. 4 line 22).

It would have been obvious to one of ordinary skill in the art at the time the invention was made or used to modify the teachings of Nowak with the teachings of Ellis because Ellis adds a protection over coating to a wide variety of substrates.

As to claim 16, Nowak teaches wherein said material carrier element is transparent to the ultraviolet radiation is taught as the carrier layer is transparent to the energy emitted by laser(col. 6 lines 4-5).

As to claim 26, Novak teaches:

a. A take-up and a supply reel supporting said tape material carrier element at two opposing ends thereof in a lengthwise slideable relationship with respect to said substrate is taught as the LAT material is in tape form with the supply roll and uptake roll(col. 3 lines 44-52 and fig. 1);

b. A tape guide unit disposed between said take-up reel and said supply reel and maintaining said tape material carrier element in predetermined relative disposition with respect to said substrate is taught as the indexing arrangements(col. 3 lines 52-55).

As to claim 27, Nowak teaches an actuator block operatively coupled to said tape guide unit for stepping said tape material carrier element in a direction substantially normal to said tape material carrier element travel and in parallel to said substrate forming a deposition layer in multiple parallel tracks fashion is taught as a motor advancement of a constant amount of material (col. 3 lines 58-59).

6. Claims 4-5 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nowak in view of Ellis and further in view of Yagi et al.

Nowak and Ellis teach the claimed invention (claim 1) see paragraph number 5 above.

As to claim 4, Yagi et al. teaches wherein said material carrier element is maintained in predetermined spaced relation is taught as the air space between the beam member and the first substrate can be regulated(col. 5 lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made or used to modify the teachings of Nowak with the teachings of Yagi et al. because

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Yagi deals with microstructures. Using technology for semiconductor integrated circuits micro-parts can be produced accurately and at low cost and quicker than parts produce by prior techniques.

As to claim 5, Yagi et al. teaches wherein a distance between said material carrier element and said substrate does not exceed 25 um is taught as the distance can be nanometer precision(col. 5 lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made or used to modify the teachings of Nowak with the teachings of Yagi et al. because Yagi deals with microstructures. Using technology for semiconductor integrated circuits micro-parts can be produced accurately and at low cost and quicker than parts produce by prior techniques.

As to claim 19, Nowak teaches further comprising a substrate-holding unit supporting said substrate in substantially parallel relationship to said material carrier element is taught as the platen (see fig. 1).

7. Claims 6, 10, 11, 14-15 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nowak in view of Ellis and further in view of Bloomstein et al.

Nowak and Ellis teach the claimed invention (claim 1) see paragraph number 5 above.

As claim 6, Bloomstein et al. teaches wherein said control means scan said energy beam over said material carrier element is taught as the beam of radiant energy is scanned over the layer(col. 3 lines 31-38).

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It would have been obvious to one of ordinary skill at the time the invention was made or used to modify the teachings of Nowak with the teachings of Bloomstein et al. because the conditions in the Bloomstein et al. induces mircochemical reactions. It deals with three-dimensional microstructures. This patent also allows the inducement of micro-chemical reactions.

As to claim 10, Bloomstein et al. teaches wherein said control means control a size of cross-section of said d energy beam is taught as modifying the laser beam intensity distribution using beam shaping optics can be used to create tool-bits which can be used to control reaction profile by changing the thermal pattern of the work piece(col. 9lines 11-15).

It would have been obvious to one of ordinary skill at the time the invention was made or used to modify the teachings of Nowak with the teachings of Bloomstein et al. because the conditions in the Bloomstein et al. induces mircochemical reactions. It deals with three-dimensional microstructures. This patent also allows the inducement of micro-chemical reactions.

As to claim 11, Bloomstein et al, teaches wherein said control means controls a shape of cross-section of said energy beam is taught as modifying the laser beam intensity distribution using beam shaping optics can be used to create tool-bits which can be used to control reaction profile by changing the thermal pattern of the work piece(col. 9lines 11-15).

It would have been obvious to one of ordinary skill at the time the invention was made or used to modify the teachings of Nowak with the teachings of Bloomstein et al. because the conditions in the Bloomstein et al. induces mircochemical reactions. It deals with three-

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dimensional microstructures. This patent also allows the inducement of micro-chemical reactions.

hanging the thermal pattern of the work piece(col. 9lines 11-15).

As to claim 14, Bloomstein et al. teaches wherein said energy beam includes an ion beam is taught as an argon ion laser(col. 2 line 62).

It would have been obvious to one of ordinary skill at the time the invention was made or used to modify the teachings of Nowak with the teachings of Bloomstein et al. because the conditions in the Bloomstein et al. induces mircochemical reactions. It deals with three-dimensional microstructures. This patent also allows the inducement of micro-chemical reactions.

hanging the thermal pattern of the work piece(col. 9lines 11-15).

As to claim 15, Bloomstein et al. teaches wherein said energy bam includes an electron beam is taught t as electron beam(col. 5 lines 10-13).

It would have been obvious to one of ordinary skill at the time the invention was made or used to modify the teachings of Nowak with the teachings of Bloomstein et al. because the conditions in the Bloomstein et al. induces mircochemical reactions. It deals with three-dimensional microstructures. This patent also allows the inducement of micro-chemical reactions.

hanging the thermal pattern of the work piece(col. 9lines 11-15).

As to claim 24, Bloomstein et al. teaches wherein said control means further includes pulse-position synchronization means for coordination between events of exposure of said deposition layer to said energy beam and the relative deposition of said material element carrier

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element, said substrate and said source of energy is taught as the beam is pulsed and exposure of the address points is a function of pulse energy, pulse length and the number of pulses. In both cases, exposure is sufficient to modify the layer in accordance(col. 3 lines 34-38).

It would have been obvious to one of ordinary skill at the time the invention was made or used to modify the teachings of Nowak with the teachings of Bloomstein et al. because the conditions in the Bloomstein et al. induces microchemical reactions. It deals with three-dimensional microstructures. This patent also allows the inducement of micro-chemical reactions.

hanging the thermal pattern of the work piece(col. 9lines 11-15).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chad Rapp whose telephone number is (703)306-4528. The examiner can normally be reached on Mon-Fri 11:00-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on (703)308-0538. The fax phone number for the organization where this application or proceeding is assigned is (703)746-7239.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-9600.

Chad Rapp
Examiner
Art Unit 2125

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cjr

L. P. Picard

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